UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 03503

CSAH NO. 24

OVER THE

CHANNEL BETWEEN DETROIT LAKE AND DEAD SHOT BAY

DISTRICT 4 - BECKER COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 03503, Piers 1 through 3, were found to be in good condition with no defects of structural significance observed. The steel pipe piles exhibited 100 percent coating failure and light surface corrosion around and below the waterline. Generally light timber debris was scattered throughout the piles on the channel bottom at all piers. The channel bottom appeared to be in stable condition with no evidence of significant scour.

INSPECTION FINDINGS:

(A) The protective coating on the cast-in-place steel pipe piles on all piers exhibited signs of initial breakdown from 1.5 feet above the waterline to the channel bottom.

(B) Random rust nodules, 1/8 inch to 1/4 inch in diameter, were observed covering over 30 percent of the surface area of the piles at Piers 2 and 3 from 10 feet below the waterline to the channel bottom.

(C) Timber debris, up to 12 inches in diameter, was observed scattered throughout the channel bottom at all piers.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 03503

Feature Crossed: The Channel between Detroit Lake and Dead Shot Bay

Feature Carried: CSAH No. 24

Location: District 4 - Becker County

Bridge Description: The superstructure consists of a four span cast-in-place concrete slab supported by two concrete abutments on piles and three cast-in-place pipe pile bent piers, numbered 1 to 3 starting from the north end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: October 29, 2002

Weather Conditions: Cloudy, "30EF

Underwater Visibility: " 10 Feet

Waterway Velocity: Negligible

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 through 3.

General Shape: Each pier consists of a single line of twelve battered and vertical cast-in-place concrete pipe piles under a common pier cap.

Maximum Water Depth at Substructure Inspected: Approximately 21 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the east end of Pier 2.

Water Surface: The waterline was approximately 5.0 feet below reference.
Waterline Elevation = 1334.4.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

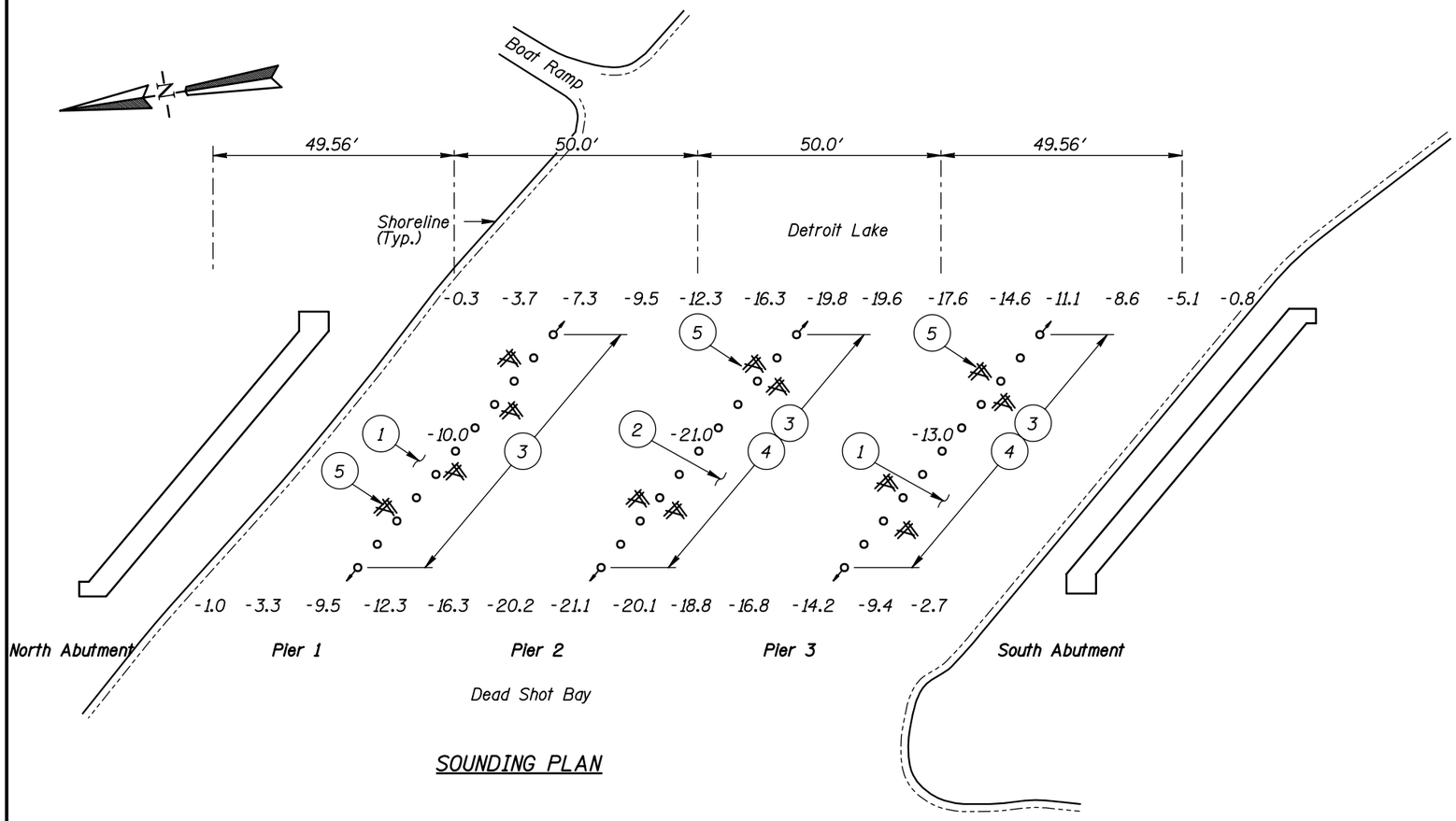
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/9/02

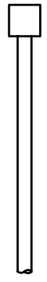
Item 113: Scour Critical Bridges: Code I/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1, 2, and 3 inspected underwater.
2. At the time of inspection on October 29, 2002, the waterline was located approximately 5.0 feet below the top of the pier cap at the east end of Pier 2. This corresponds with a waterline elevation of 1334.4 based on design drawings.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom consisted of 6 inch diameter cobbles and sandy silt with up to 1 foot of probe rod penetration.

(2) The channel bottom consisted of sand with up to 6 inches of probe rod penetration.

(3) The steel pipe piles exhibited coating failure with light surfacce corrosion from 1.5 feet above the waterline to the channel bottom.

(4) The steel pipe piles exhibited rust nodules, typically 1/8 inch in diameter and up to 1/4 inch in diameter, over 30 percent of the surface area from 10 feet below the waterline to the channel bottom.

(5) Timber debris, consisting of logs up to 12 inches in diameter, was scattered throughout the piles of all the piers.

Legend

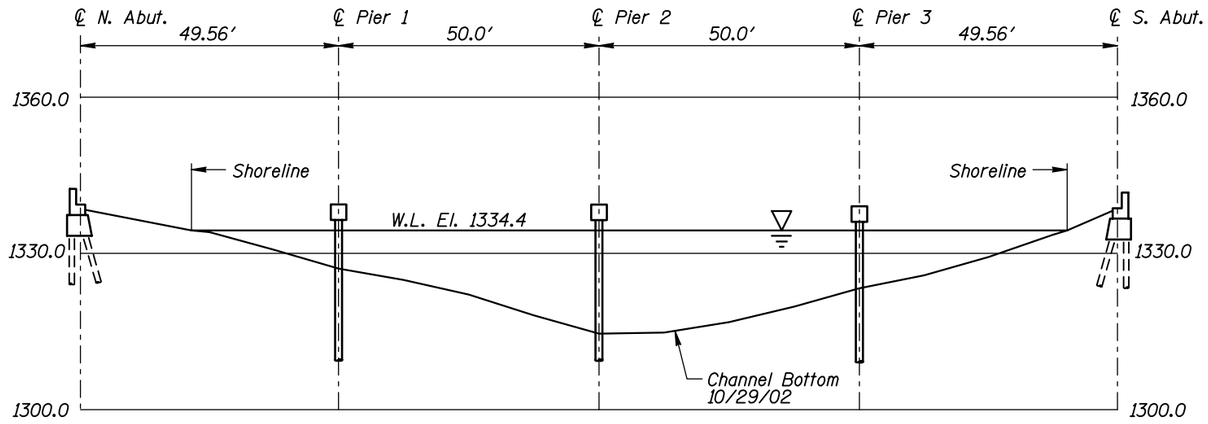
-7.3	Sounding Depth from Waterline (10/29/02)
o	16" Diameter Steel Pipe, Cast-in-place Concrete Pile
o	Battered 16" Diameter Steel Pipe, Cast-in-place Concrete Pile

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

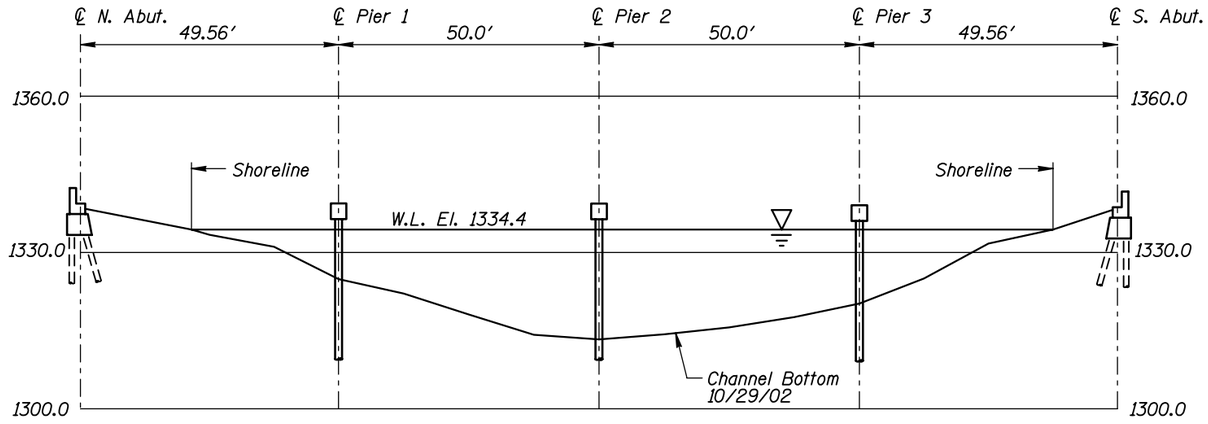
STRUCTURE NO. 03503
OVER DETROIT LAKE AND DEAD SHOT BAY
DISTRICT 4, BECKER COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 351203503		Figure No.: 1



EAST FASCIA PROFILE



WEST FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
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UNDERWATER BRIDGE INSPECTION

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DISTRICT 4, BECKER COUNTY

EAST AND WEST
FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=30′
Code: 351203503		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking Southeast.

Photograph 2. View of Pier 1, Looking Southeast.

Photograph 3. View of Western End of Pier 1, Looking Southeast.

Photograph 4. View of Pier 2, Looking Southwest.

Photograph 5. View of Pier 3, Looking North.

Photograph 6. Typical Coating Failure on the Steel Pipe Piles.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 29, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 03503 WEATHER: Cloudy, "30E F
WATERWAY CROSSED: Channel between the Detroit River and Dead Shot Bay
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins
EQUIPMENT: Scuba, Sounding Pole, Camera, u/w Light, Scraper, Probe Rod, Lead Line

TIME IN WATER: 1:00 A.M.
TIME OUT OF WATER: 1:45 P. M.
WATERWAY DATA: VELOCITY Negligible/None
VISIBILITY "10 feet
DEPTH 21.1 feet maximum at Pier 2
ELEMENTS INSPECTED: Piers 1, 2 and 3
REMARKS: Overall, substructure units inspected were found to be in good condition with no defects of structural significance observed. The steel pipe piles exhibited 100 percent coating failure from 1.5 feet above the waterline to the channel bottom. Light surface corrosion, with rust nodules typically 1/8 inch in diameter and up to 1/4 inch in diameter, was observed over 30 percent of the surface area of the steel pipe piles at Piers 2 and 3 from 10 feet below the waterline to the channel bottom. Timber debris, up to 12 inches in diameter, was observed scattered throughout the channel bottom at all piers. The channel bottom appeared to be in stable condition with no evidence of significant scour.

FURTHER ACTION NEEDED: _____ YES ____X___ NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 03503
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Channel between Detroit Lake and Dead Shot Bay

INSPECTION DATE October 29, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	10.0’	7	N	N	9	N	7	8	8	8	7	7	N	7	N	N	N	N
	Pier 2	21.1’	7	N	N	9	N	7	8	N	N	7	7	N	7	N	N	N	N
	Pier 3	14.2’	7	N	N	9	N	7	8	8	8	7	7	N	7	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, substructure units inspected were found to be in good condition with no defects of structural significance observed. The steel pipe piles exhibited 100 percent coating failure from 1.5 feet above the waterline to the channel bottom. Light surface corrosion, with rust nodules typically 1/8 inch in diameter and up to 1/4 inch in diameter, was observed over 30 percent of the surface area of the steel pipe piles at Piers 2 and 3 from 10 feet below the waterline to the channel bottom. Timber debris, up to 12 inches in diameter, was observed scattered throughout the channel bottom at all piers. The channel bottom appeared to be in stable condition with no evidence of significant scour.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.